CCMRP

The California Report on Coronary Artery Bypass Graft Surgery

1997 – 1998 Hospital Data

Summary Report

California CABG Mortality Reporting Program

July 2001

PBGH
Pacific Business Group on Health

Planning for California's Health Care Future
OSHPD
OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT

THE CALIFORNIA CORONARY ARTERY BYPASS GRAFT MORTALITY REPORTING PROGRAM

The Pacific Business Group on Health (PBGH) and the California Office of Statewide Health Planning and Development (OSHPD) are working together in a unique private-public sector partnership to develop the California CABG Mortality Reporting Program (CCMRP). The development of CCMRP reflects the commitment of both organizations to work with health care providers to improve the quality of care statewide.

PBGH is a statewide coalition of 45 public and private sector purchasers of care in California. PBGH's member organizations represent over 3 million employees, dependents, and retirees, and they account for $3 billion in annual health care expenditures. OSHPD is the state agency that plans for and supports the development of health delivery systems that meet the current and future needs of the people of California. OSHPD conducts studies on access, cost, and quality, and is responsible for reporting risk-adjusted hospital outcomes data.

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OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT

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THE CALIFORNIA REPORT ON CORONARY ARTERY BYPASS GRAFT SURGERY

1997-1998 Hospital Data

SUMMARY REPORT

July 2001

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PREFACE

July 2001

It is with great pleasure that we share with you the first set of results from the California Coronary Artery Bypass Graft (CABG) Mortality Reporting Program (CCMRP). ***The California Report on Coronary Artery Bypass Graft Surgery: 1997-1998 Hospital Data*** is the first of a series of periodic reports on bypass surgery outcomes for California hospitals. This report is an important milestone for several reasons.

CCMRP represents an important partnership between the state, purchasers, and hospitals to voluntarily collect and release comparative quality of care data. In an environment of scarce resources, collaboration is critical. Of the 118 hospitals in California that performed bypass surgery in 1997-1998, 79 voluntarily agreed to submit their data for public reporting to CCMRP. The cases submitted by the 79 hospitals represent more than 70% of all bypass surgeries performed in California during that time period.

The participating hospitals, regardless of their individual results, are to be commended for their leadership and explicit commitment to quality measurement and improvement. Public release of comparative surgery outcomes data is helpful for hospitals in their ongoing efforts to improve clinical quality and for patients who, heretofore, have not had readily available, comparable information to help inform their decisions about where to receive treatment. California joins only three other states (NY, NJ, PA) with outcome data on bypass surgery.

This report is the result of the first round of an ongoing data collection effort by CCMRP. By measuring and making comparative risk-adjusted mortality rates publicly available, CCMRP aims to further the following important goals:

- Improve the quality of care and surgical outcomes for patients undergoing bypass surgery at all California hospitals;
- Stimulate a dialogue among surgeons and facilitate quality review of surgical procedures and processes of care that will lead to improved clinical outcomes; and,
- Increase consumer awareness and use of quality information.

The CCMRP is a unique private-public sector partnership between the Pacific Business Group on Health (PBGH) and the California Office of Statewide Health Planning and Development (OSHPD). PBGH is a California coalition of 45 public and private sector purchasers of care and its members represent over 3 million employees, dependents and retirees. OSHPD is the state agency that plans for and supports the development of California's health care delivery system and produces outcomes studies of the care being provided by California hospitals.

Again, PBGH and OSHPD commend the hospitals that have demonstrated leadership in measuring and publicly reporting on the quality of bypass surgery. We also wish to recognize the important contribution made by a host of individuals in the participating hospitals who dedicated their scarce time and resources to collecting the data and to providing feedback on the design of the program and the risk model. Additionally, we wish to thank the CCMRP

Technical Advisory Panel members, who played a critical role in helping to structure California's bypass surgery reporting program. PBGH and OSHPD also appreciate the assistance provided by the Society of Thoracic Surgeons and its California Chapter in helping to develop and implement CCMRP.

CCMRP looks forward to the participation of additional hospitals in this important quality measurement and improvement project, so that all hospitals are accountable for ensuring the best possible outcomes for their patients. Hospitals that are interested in joining CCMRP are encouraged to contact Cheryl Damberg, CCMRP Co-Director at PBGH (cdamberg@ix.netcom.com, 310.396.7036).

Sincerely,

Peter V. Lee
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David M. Carlisle, M.D., Ph.D.
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The California CABG Mortality Reporting Program reflects the efforts and significant contributions of numerous individuals from PBGH and OSHPD. Dr. Arnold Milstein, PBGH Medical Director, deserves special acknowledgment for his role in helping to initiate the development of CCMRP. PBGH and OSHPD wish to thank the California Chapter of the Society for Thoracic Surgeons (CASTS) for its support and assistance in implementing CCMRP.

CCMRP also wishes to acknowledge the following individuals:

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INTRODUCTION

Each year, approximately 27,000 Californians with advanced heart disease undergo a major surgical procedure known as coronary artery bypass graft (CABG) surgery. In California, 118 hospitals offer bypass surgery to adult patients. Prior to the release of this report, little was known about how well California hospitals performed this surgery. Such information is critical for hospital quality improvement efforts and for enabling patients and their families to make informed decisions about where to receive treatment.

In 1995, the Pacific Business Group on Health (PBGH) and the Office of Statewide Health Planning and Development (OSHPD) established a public-private sector partnership—the California Coronary Artery Bypass Graft (CABG) Mortality Reporting Program (CCMRP)—to collect mortality data on a voluntary basis from California hospitals and publicly report on this key marker of clinical quality. This summary report, and the companion ***California Report on Coronary Artery Bypass Graft Surgery 1997-1998 Hospital Data: Technical Report***, are the first of what will become a series of periodic public reports showing comparative results for California hospitals that perform bypass surgery.

This report represents an important milestone. Its release reflects significant voluntary collaboration among hospitals, the surgical community, the state, and purchasers to compile, analyze, and report comparative data on hospital performance regarding isolated coronary artery bypass graft surgery.[1] In an environment of scarce resources, collaboration is critical. California joins only three other states with outcome data on bypass surgery—New York, New Jersey, and Pennsylvania, each of which mandates the collection of mortality data. The large number of hospitals that are participating in CCMRP underscores the serious commitment made by these hospitals to measure and improve the quality of bypass surgery care they provide to their patients. Of the 118 hospitals in California that performed bypass surgery in 1997-1998, 79 voluntarily agreed to submit their data for public reporting to CCMRP. The cases submitted by the 79 hospitals represent more than 70% of all bypass surgeries performed in California during that time period. The participating hospitals, regardless of their individual results, are to be commended for their leadership and explicit commitment to quality measurement and improvement. They have taken a fundamental first step toward ensuring excellence in the quality of care they provide to patients.

THE NEED FOR COMPARATIVE OUTCOME INFORMATION

Coronary artery bypass graft surgery is one of the most frequently performed and costly surgeries. Based on data from the 1998 OSHPD Patient Discharge Abstract database,[2] 27,660 isolated coronary artery bypass graft surgeries were performed at 118 California hospitals.[3] For 1998, the average hospital charge (prior to any group discounts) for a bypass procedure was

[1] "Isolated" CABG means that no patient received both a CABG and an additional major procedure such as a valve repair or replacement during the same operation. Isolated CABG's comprise the majority of heart operations in California and the U.S.

[2] Office of Statewide Health Planning and Development Discharge Data, 1998. Sacramento, CA.

[3] All 118 hospitals performed at least 25 adult isolated CABG's each during 1998.

approximately $78,000.[4] For some hospitals, only births comprised a larger proportion of their total revenue. Bypass surgery is generally considered a very safe surgery and has quite low death rates associated with it—2.8% of all patients who undergo bypass surgery die from complications during or after the operation. However, California has a significant number of hospitals that perform fewer bypass surgeries each year than is recommended by the American College of Cardiology (ACC) to achieve good outcomes.[5] In 1998, 68 hospitals in California performed fewer than the 200-300 per year minimum volume of bypass surgeries as recommended by the ACC.

This is in contrast to New York, which limits the number of hospitals permitted to perform bypass surgery and whose hospitals each perform a higher volume of bypass surgeries than the majority of California hospitals. New York hospitals report some of the lowest death rates from bypass surgeries among all hospitals in the country. Given that research studies have shown a positive relationship between a higher volume of bypass and other surgical procedures and better clinical outcomes (i.e., lower death rates), this raises special concerns for those facilities with very low numbers of bypass surgeries (those performing fewer than 100 per year). Consequently, it is important to monitor the performance of all California hospitals to ensure that they are providing the best surgical care for their patients.

Individuals and employers who often serve as purchasing agents for employee and dependent populations face difficulties in making informed health care purchasing and treatment decisions. Rarely is comparative information on health outcomes readily available to help guide consumer and purchaser choice in the marketplace. Consequently, purchasing and treatment decisions typically are based on price alone and not on the overall value of services—a key component of which is the quality of care.

Heretofore, there has been no standardized comparative data on bypass surgery in California to evaluate performance and to use this information for quality improvement. By making available comparative hospital-level data on bypass surgery death rates, CCMRP seeks to provide comparative outcome data to:

- ***Hospitals and providers***—to stimulate and facilitate quality review of surgical procedures and processes of care that will lead to improved outcomes;
- ***Purchasers of care***—to assess hospital performance and incorporate quality measures into purchasing decisions; and,
- ***Patients and their family members***—to enable them to make more informed treatment decisions.

[4] Office of Statewide Health Planning and Development Discharge Data. 1998. Sacramento, California. Few hospitals actually receive payment in the amount that charges represent. Reimbursement rates typically are much lower, ranging between $15,000 to $30,000 per case.

[5] American College of Cardiology and American Heart Association. 1991. ACC/AHA Guidelines and Indications for Coronary Artery Bypass Graft Surgery: A Report of the American College of Cardiology/American Heart Association Task Force on Assessment of Diagnostic and Therapeutic Cardiovascular Procedures Subcommittee on Coronary Artery Bypass Graft Surgery. *Circulation* 83(2): 1125-1173.

DESCRIPTION OF THE REPORTING PROGRAM

The California Coronary Artery Bypass Graft Mortality Reporting Program (CCMRP) is a voluntary statewide hospital reporting program designed to collect and report data on coronary artery bypass graft (CABG) operative mortality at the hospital level. The CCMRP will produce uniform, comparative hospital-level mortality data, adjusted to account for differences across hospitals in the mix of patients undergoing CABG surgery and make this information publicly available to surgeons, hospitals, purchasers, consumers, and policymakers.

At the start of the project, PBGH and OSHPD assembled an advisory panel to provide guidance on the design of technical aspects of the program. The technical advisory panel has met periodically to discuss the outcome measure, purpose of the reporting program, selection of data elements, training of hospital staff and auditing of data to ensure data quality, and review and comment on the analysis plan, study findings, and the presentation of the results. The CCMRP Technical Advisory Panel is comprised of cardiac surgeons, cardiologists, a hospital administrator, and clinicians with expertise in quality of care and risk adjustment.

PBGH and OSHPD designed CCMRP to be clinically and statistically sound, and administratively feasible for hospitals to participate. In structuring CCMRP, staff adopted a paradigm similar to the New York State Department of Health and Society for Thoracic Surgeons (STS) programs. These systems have established a data collection system, each of which is located in the hospital or physician's office and focuses on capturing clinical data that identify the pre-operative condition of the patient.[6] In defining the set of data elements for CCMRP, staff reviewed the clinical literature on risk predictors for bypass surgery and examined variables collected by the leading cardiac reporting programs.[7] Additionally, staff reviewed a consensus statement prepared by a panel of researchers from the major CABG reporting programs including the STS, the New York State Department of Health, the Northern New England Cardiovascular consortium, the Parsonnet group, and the Veterans Affairs group.[8] The consensus statement examined the relative contribution of key variables collected by the various programs to adjust for differences in the severity of illness of patients across institutions.

PBGH and OSHPD, with the recommendation of the CCMRP Technical Advisory Panel, decided to use data variables and definitions drawn from the STS national reporting system to facilitate hospital participation. Because the STS data collection software, risk-adjustment algorithm, and surgical results are proprietary and confidential, PBGH and OSHPD decided not to use the specific STS software and methods. An underlying tenet of CCMRP is that the risk-adjustment model will be publicly available for review and use by hospitals, researchers, and other interested individuals. To provide hospitals with flexibility and to avoid duplicating existing

[6] Hannan, EI; D Kumar, M Racz, et al. 1994. New York State's Cardiac Surgery Reporting System: Four Years Later. *Ann Thorac Surg* 58:1852-1857. Edwards, FH; RE Clark, and M Schwartz. 1994. Coronary Artery Bypass Grafting: the Society of Thoracic Surgeons National Database Experience. *Ann Thorac Surg* 57: 12-9.

[7] Please refer to the reference section of the *California Report on Coronary Artery Bypass Graft Surgery 1997-1998 Hospital Data: Technical Report* for a listing of key articles.

[8] Jones, RH; EL Hannan, K Hammermeister, et al. 1996. Identification of Preoperative Variables Needed for Risk Adjustment of Short-term Mortality after Coronary Artery Bypass Graft Surgery. *JACC* 28(6): 1478-87.

data collection systems such as the STS system, CCMRP allows participating hospitals to submit information in several different ways. For institutions without any data collection system, CCMRP prepared a custom-written computer-based data collection instrument and provided this free-of-charge to any hospital that requested the software.

Clinical and demographic data on all adult patients undergoing isolated CABG surgery are submitted quarterly to CCMRP by hospitals participating in the program. Upon receipt of the data, CCMRP reviews the data for completeness and errors in coding. The staff of CCMRP work with participating hospitals to ensure that the data submitted are correct prior to running the final risk model. All hospitals were given the opportunity to review their risk-adjusted rates prior to public release of this report.

HOSPITAL PARTICIPATION

CCMRP depends on the voluntary participation of hospitals. PBGH and OSHPD wish to thank each of the 79 hospitals that volunteered to participate and publicly report their risk-adjusted mortality rates. The results and conclusions contained in this report can be used to compare hospitals that voluntarily chose to participate, but not those hospitals that elected not to participate.

CCMRP approached each of the 118 California hospitals that performed more than 25 adult isolated CABG surgeries annually with an offer to join CCMRP.[9] Letters of invitation to participate were sent to the Chief Executive Officer and Chief of Cardiothoracic Surgery at each institution. CCMRP staff made follow-up phone calls to encourage participation and offered to come on-site and brief hospital staff about the program. One-on-one meetings were held with interested hospitals to inform them of the program's purpose, structure, requirements of participation, and to address questions. As part of the recruitment process, all hospitals received multiple mailings and phone calls to enlist interest and participation between fall 1996 and March 1999. PBGH and OSHPD sent a final invitation letter by certified mail to the CEO's of non-participating hospitals to enlist their participation in the 1997-1998 data analysis and report. The letter provided a deadline for joining the program for this report and indicated that hospitals declining to participate would be listed as such in the public report.[10]

Hospitals were asked to sign a "Principles of Participation" agreement that formally committed them to:

- Report pre-operative risk factors and mortality data for all isolated CABG surgeries performed during the calendar year (a hospital was not permitted to participate if it chose to submit only a portion of its caseload);
- Participate in a training session designed to improve consistency in coding practices across hospitals;

[9] In 1998, 118 out of 121 California hospitals met this threshold for participation.

[10] Among hospitals that elected not to join the program, hospital staff gave a range of reasons for not participating, including a lack of sufficient staff resources to collect data, discomfort with publicly releasing data, and concern about the adequacy of the risk-adjustment method to fairly account for the sickness level of the patients they treat.

- Submit data on a quarterly basis using a standard data entry format and standard variable definitions;
- Participate in periodic audits to verify data quality; and,
- Publicly release their risk-adjusted mortality rates.

Table 1 lists the 118 hospitals in California that performed isolated CABG surgeries (adult cases only) in 1998 and their participation status in CCMRP.[11] Hospitals that participate in CCMRP have agreed to make their institution's risk-adjusted mortality rates publicly available.

[11] UC San Diego University Medical Center comprises two hospital facilities (Thornton and Hillcrest).

Table 1: California Hospitals that Perform Adult CABG Surgeries—1998

Hospital	CCMRP Participation Status in 1997/1998 Program	Region	Number of Open-heart Procedures*	Number of Isolated CABG Surgeries*	Isolated CABG as a % of all Open-heart Procedures
Alta Bates Medical Center	Participating	San Francisco Bay Area and San Jose	172	120	69.8
Alvarado Hospital Medical Center	Participating	Greater San Diego	221	162	73.3
Anaheim Memorial Hospital	Participating	Orange County	156	125	80.1
Antelope Valley Hospital Medical Center	Declined to Participate	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	54	48	88.9
Bakersfield Memorial Hospital	Declined to Participate	Central California	417	315	75.5
Beverly Hospital	Declined to Participate	Greater Los Angeles	37	32	86.5
Brotman Medical Center	Declined to Participate	Greater Los Angeles	73	62	84.9
California Pacific Medical Center	Participating	San Francisco Bay Area and San Jose	279	178	63.8
Cedars-Sinai Medical Center	Participating	Greater Los Angeles	717	412	57.5
Centinela Hospital Medical Center	Declined to Participate	Greater Los Angeles	97	66	68.0
Community Memorial Hospital—San Buenaventura	Participating	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	240	192	80.0
Dameron Hospital	Participating	Central California	124	105	84.7
Daniel Freeman Memorial Hospital	Participating	Greater Los Angeles	220	160	72.7
Desert Regional Medical Center	Participating	Inland Empire, Riverside and San Bernardino	146	120	82.2
Doctor's Hospital—San Pablo	Participating	San Francisco Bay Area and San Jose	109	93	85.3
Doctors Medical Center—Modesto	Participating	Central California	576	457	79.3
Dominican Santa Cruz Hospital	Participating	San Francisco Bay Area and San Jose	181	134	74.0
Downey Community Hospital	Participating	Greater Los Angeles	145	116	80.0
Eisenhower Medical Center	Declined to Participate	Inland Empire, Riverside and San Bernardino	185	147	79.5
El Camino Hospital	Participating	San Francisco Bay Area and San Jose	156	110	70.5
Encino-Tarzana Regional Medical Center	Participating	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	260	183	70.4
Enloe Medical Center	Declined to Participate	Sacramento Valley and Northern California	313	273	87.2

Table 1: California Hospitals that Perform Adult CABG Surgeries—1998 (cont.)

Hospital	CCMRP Participation Status in 1997/1998 Program	Region	Number of Open-heart Procedures*	Number of Isolated CABG Surgeries*	Isolated CABG as a % of all Open-heart Procedures
Fountain Valley Regional Hospital and Medical Center—Euclid	Declined to Participate	Orange County	200	174	87.0
French Hospital Medical Center	Declined to Participate	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	309	257	83.2
Fresno Community Hospital and Medical Center	Declined to Participate	Central California	420	330	78.6
Garfield Medical Center	Declined to Participate	Greater Los Angeles	120	102	85.0
Glendale Adventist Medical Center—Wilson Terrace	Participating	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	247	206	83.4
Glendale Memorial Hospital and Health Center	Participating	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	236	192	81.4
Good Samaritan Hospital—Los Angeles	Declined to Participate	Greater Los Angeles	1019	733	71.9
Good Samaritan Hospital of Santa Clara Valley/San Jose (Columbia)	Declined to Participate	Greater San Francisco Bay Area and San Jose	518	398	76.8
Granada Hills Community Hospital	Participating	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	84	75	89.3
Green Hospital of Scripps Clinic	Declined to Participate	Greater San Diego	272	181	66.5
Heart Hospital of the Desert	Participating	Inland Empire, Riverside and San Bernardino	162	117	72.2
Hoag Memorial Hospital Presbyterian	Participating	Orange County	369	269	72.9
Huntington Memorial Hospital	Declined to Participate	Greater Los Angeles	502	377	75.1
Inter-Community Medical Center—Citrus Valley	Participating	Greater Los Angeles	277	225	81.2
John Muir Medical Center	Participating	San Francisco Bay Area and San Jose	178	124	69.7
Kaiser Foundation Hospital—Los Angeles (Sunset)	Participating	Greater Los Angeles	1685	1267	75.2
Kaiser Foundation Hospital—San Francisco (Geary)	Participating	San Francisco Bay Area and San Jose	1430	992	69.4

Table 1: California Hospitals that Perform Adult CABG Surgeries—1998 (cont.)

Hospital	CCMRP Participation Status in 1997/1998 Program	Region	Number of Open-heart Procedures*	Number of Isolated CABG Surgeries*	Isolated CABG as a % of all Open-heart Procedures
Kaweah Delta District Hospital	Participating	Central California	367	295	80.4
Lakewood Regional Medical Center	Declined to Participate	Greater Los Angeles	273	236	86.4
Lancaster Community Hospital	Participating	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	50	47	94.0
Little Company of Mary Hospital	Participating	Greater Los Angeles	240	165	68.8
Loma Linda University Medical Center	Declined to Participate	Inland Empire, Riverside and San Bernardino	824	471	57.2
Long Beach Community Hospital	Declined to Participate	Greater Los Angeles	140	116	82.9
Long Beach Memorial Medical Center	Participating	Greater Los Angeles	495	370	74.7
Los Angeles County—USC Med Ctr	Participating	Greater Los Angeles	227	117	51.5
Los Angeles County Harbor—UCLA	Declined to Participate	Greater Los Angeles	252	156	61.9
Los Robles Regional Medical Center	Declined to Participate	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	345	270	78.3
Marian Medical Center	Declined to Participate	Central California	117	100	85.5
Marin General Hospital	Participating	San Francisco Bay Area and San Jose	115	87	75.7
Memorial Medical Center—Modesto	Participating	Central California	326	276	84.7
Mercy General Hospital	Participating	Sacramento Valley and Northern California	1714	1269	74.0
Mercy Medical Center—Redding	Participating	Sacramento Valley and Northern California	300	226	75.3
Mercy San Juan Hospital	Participating	Sacramento Valley and Northern California	246	185	75.2
Methodist Hospital of Southern California	Participating	Greater Los Angeles	277	210	75.8
Mills Peninsula Medical Center	Participating	San Francisco Bay Area and San Jose	219	162	74.0
Mission Hospital Regional Medical Center	Declined to Participate	Orange County	297	233	78.5
Mt. Diablo Medical Center	Participating	San Francisco Bay Area and San Jose	683	544	79.6
Northridge Hospital Medical Center	Participating	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	173	131	75.7

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Hospital	CCMRP Participation Status in 1997/1998 Program	Region	Number of Open-heart Procedures*	Number of Isolated CABG Surgeries*	Isolated CABG as a % of all Open-heart Procedures
O'Connor Hospital—San Jose	Declined to Participate	San Francisco Bay Area and San Jose	215	161	74.9
Palomar Medical Center	Participating	Greater San Diego	188	146	77.7
Pomona Valley Hospital Medical Center	Participating	Inland Empire, Riverside and San Bernardino	311	268	86.2
Presbyterian Intercommunity Hospital	Participating	Greater Los Angeles	151	113	74.8
Providence Holy Cross Medical Center	Participating	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	107	78	72.9
Providence St. Joseph Medical Center	Participating	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	309	202	65.4
Queen of the Valley Hospital—Napa	Declined to Participate	San Francisco Bay Area and San Jose	157	123	78.3
Redding Medical Center	Participating	Sacramento Valley and Northern California	673	496	73.7
Riverside Community Hospital	Participating	Inland Empire, Riverside and San Bernardino	473	364	77.0
Saddleback Memorial Medical Center	Participating	Orange County	220	173	78.6
Salinas Valley Memorial Hospital	Participating	San Francisco Bay Area and San Jose	370	314	84.9
San Antonio Community Hospital	Participating	Inland Empire, Riverside and San Bernardino	170	143	84.1
San Joaquin Community Hospital	Declined to Participate	Central California	370	291	78.6
San Jose Medical Center (Columbia)	Declined to Participate	Greater San Francisco Bay Area and San Jose	115	89	77.4
Santa Barbara Cottage Hospital	Participating	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	372	266	71.5
Santa Clara Valley Medical Center	Declined to Participate	San Francisco Bay Area and San Jose	98	65	66.3
Santa Monica—UCLA Medical Center	Participating	Greater Los Angeles	66	44	66.7
Santa Rosa Memorial Hospital	Declined to Participate	San Francisco Bay Area and San Jose	345	245	71.0
Scripps Memorial Hospital—La Jolla	Participating	Greater San Diego	601	339	56.4
Scripps Mercy Hospital and Medical Center	Declined to Participate	Greater San Diego	302	222	73.5
Sequoia Hospital	Participating	San Francisco Bay Area and San Jose	516	250	48.4
Seton Medical Center	Participating	San Francisco Bay Area and San Jose	673	558	82.9
Sharp Chula Vista Medical Center	Participating	Greater San Diego	328	260	79.3
Sharp Grossmont Hospital	Participating	Greater San Diego	190	133	70.0

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Sharp Memorial Hospital	Participating	Greater San Diego	474	314	66.2
St. Agnes Medical Center	Declined to Participate	Central California	519	388	74.8
St. Bernadine Medical Center	Participating	Inland Empire, Riverside and San Bernardino	697	565	81.1
St. Francis Medical Center	Participating	Greater Los Angeles	108	89	82.4
St. Helena Hospital	Participating	San Francisco Bay Area and San Jose	287	250	87.1
St. John's Hospital and Health Center	Participating	Greater Los Angeles	200	141	70.5
St. John's Regional Medical Center	Participating	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	262	198	75.6
St. Joseph Hospital—Orange	Participating	Orange County	381	292	76.6
St. Joseph's Medical Center—Stockton	Participating	Central California	357	282	79.0
St. Jude Medical Center	Participating	Orange County	270	197	73.0
St. Mary Medical Center—Long Beach	Participating	Greater Los Angeles	101	79	78.2
St. Mary Regional Medical Center—Apple Valley	Declined to Participate	Inland Empire, Riverside and San Bernardino	131	117	89.3
St. Mary's Medical Center—San Francisco	Declined to Participate	San Francisco Bay Area and San Jose	972	831	85.5
St. Vincent Medical Center	Participating	Greater Los Angeles	359	229	63.8
Stanford University Hospital	Participating	San Francisco Bay Area and San Jose	567	275	48.5
Summit Medical Center	Participating	San Francisco Bay Area and San Jose	232	153	65.9
Sutter Memorial Hospital	Participating	Sacramento Valley and Northern California	1080	707	65.5
Torrance Memorial Medical Center	Participating	Greater Los Angeles	300	201	67.0
Tri-City Medical Center	Participating	Greater San Diego	278	226	81.3
UC San Diego University Medical Center (Thornton and Hillcrest)	Participating (both hospitals)	Greater San Diego	189	49	25.9
UCLA Medical Center	Participating	Greater Los Angeles	571	180	31.5
UCSF Medical Center	Participating	San Francisco Bay Area and San Jose	507	138	27.2
UCSF/Mount Zion	Participating	San Francisco Bay Area and San Jose	56	42	75.0

Table 1: California Hospitals that Perform Adult CABG Surgeries—1998 (cont.)

Hospital	CCMRP Participation Status in 1997/1998 Program	Region	Number of Open-heart Procedures*	Number of Isolated CABG Surgeries*	Isolated CABG as a % of all Open-heart Procedures
University of California Davis Medical Center	Participating	Sacramento Valley and Northern California	207	136	65.7
University of California Irvine Medical Center	Participating	Orange County	138	95	68.8
USC University Hospital	Participating	Greater Los Angeles	182	72	39.6
Valley Presbyterian Hospital	Declined to Participate	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	86	72	83.7
Washington Hospital—Fremont	Participating	San Francisco Bay Area and San Jose	217	166	76.5
West Anaheim Medical Center	Declined to Participate	Orange County	67	62	92.5
West Hills Regional Medical Center	Declined to Participate	San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	113	82	72.6
Western Medical Center—Santa Ana	Declined to Participate	Orange County	159	124	78.0
Western Medical Center Hospital—Anaheim	Declined to Participate	Orange County	200	164	82.0
White Memorial Medical Center	Declined to Participate	Greater Los Angeles	112	90	80.4

**Source: Office of Statewide Health Planning and Development (OSHPD) Patient Discharge database. Excludes three Veterans Administration Hospitals in Los Angeles, San Diego, and San Francisco that also perform CABG surgeries. For this table, counts of surgical procedures are calculated from the patient's date of discharge from a hospital (that is, a patient receiving a CABG surgery on December 30, 1997 who was discharged on January 3, 1998 is counted among 1998 discharges).*

ADJUSTING THE HOSPITAL MORTALITY DATA FOR PATIENT MIX

To make a fair comparison among hospitals, it is necessary to adjust for differences in the risk-level of each hospital's patients. CCMRP "levels the playing field" by accounting for the pre-operative condition of each patient at the time he or she is admitted to the hospital. Hospitals that routinely handle "tougher" cases get a larger risk-adjustment factor, while hospitals that handle "easier" cases get a smaller factor. CCMRP included as risk-adjustment variables only those data elements that describe the patient's condition as closely as possible to the time of hospital admission. Readers interested in a more thorough explanation of the data, risk-adjustment methods, and results should refer to ***The California Report on Coronary Artery Bypass Graft Surgery 1997-1998 Hospital Data: Technical Report.***

The risk analysis is based on 30,814 isolated CABG cases for 82 California hospitals that submitted data to CCMRP for 1997 and 1998. Data for these 82 hospitals represent more than 70% of the isolated CABG cases performed in California.[12] CCMRP collected a set of 41 data elements, a subset of which describe the demographic characteristics and pre-operative condition (risk factors) for each patient who underwent an isolated CABG procedure at the participating hospitals. To calculate risk-adjustment factors, the CCMRP used a multivariate logistic regression model to weigh the importance of 23 patient-level pre-operative risk variables. The model included factors such as the age, sex, and race of the patient, together with the urgency of the operation (acuity), ejection fraction, severity of congestive heart failure, and the level of creatinine in the blood. The multivariate logistic regression model evaluates the relationship between each of the demographic and pre-operative risk variables and the likelihood of in-hospital mortality.

The outcome measure used was **in-hospital mortality** (i.e., the deaths that occurred in the same hospital admission). In-hospital mortality was selected as a measure of hospital quality for isolated CABG surgeries because it can be reliably measured and affords comparability across hospitals. It should be noted that mortality is not the only measure of the quality of bypass surgery. Process measures and complications are also important quality indicators; however, these measures are difficult to measure reliably and in a consistent fashion across institutions to permit fair comparisons.

CCMRP conducted a medical chart audit to review the quality of the data submitted for 1998. The purpose of the audit was to determine whether the rating received by the hospital was in any way a function of that hospital's coding practices. That is, did hospitals classified as better performers systematically overstate the severity of their cases, or did hospitals classified as worse performers systematically understate the severity of their patient case-mix? Twenty-six hospitals were audited out of the 79 (33%) that are reporting publicly for the first round of data collection. For the audit, 1004 medical charts were reviewed. CCMRP concluded from the audit analysis that there was no relationship between a hospital's average patient risk-level and the performance rating received by the hospital.

[12] Three of the 82 Hospitals that submitted data for the 1997-1998 period withdrew from the program after the analysis was completed but prior to preparation of the report, leaving 79 hospitals that agreed to publicity report their results. However, data from all 82 hospitals was used to develop the risk-adjustment model.

RISK-ADJUSTED HOSPITAL RESULTS FOR 1997-1998

In the 1997-1998 CCMRP data set used to develop the risk-adjustment model, a total of 802 patients out of 30,814 died in-hospital following the isolated CABG procedure. This results in an overall in-hospital mortality rate of 2.6%. In contrast, the New York State Department of Health reported an in-hospital mortality rate of 2.15% for New York hospitals for 1998 (see www.health.state.ny.us).

Because hospitals that chose not to participate did not submit data to CCMRP, a direct comparison of their risk-adjusted rates is not possible. Table 2 presents data from the 1998 OSHPD Hospital Discharge Abstracts and compares the number of isolated CABG surgeries and the "raw" or unadjusted death rate for participating and non-participating hospitals. On average, participating hospitals performed more CABG surgeries than non-participants (approximately 250 per year for participants vs. 209 per year for non-participants), but the unadjusted death rate for the two groups is essentially identical.

Table 2: Comparison of Unadjusted Mortality Rates for CCMRP Participating and Non–Participating Hospitals, 1998 Data

	Number of Isolated CABG's	Share of All California CABG Cases (%)	In–hospital Deaths After CABG	Unadjusted Death Rate (%)
Participating Hospitals (79)[13]	19,714	71.3	522	2.65
Non–Participating Hospitals (38)	7,946	28.7	213	2.68
Total (118)	27,660	100.0	735	2.66

A logistic regression model was used to develop risk-adjusted mortality statistics for each of the participating hospitals to control for differences in patient case-mix. Specifically, the risk adjustment model calculates the expected number of in-hospital deaths for isolated CABG patients in each hospital, and the expected mortality rate for each hospital. The graphs (Figures 1-8) that follow provide two important pieces of information about each hospital's performance:

The observed to expected mortality ratio (O/E ratio): The O/E ratio is the number of observed (actual) deaths for the hospital, divided by the number of expected deaths for the hospital (as determined from the risk-adjustment model). If the O/E ratio is higher than 1.0, it means that the hospital had more deaths than would have been expected given the case-mix

[13] For the 1997-1998 data reporting period, 80 out of a total of 118 California hospitals participated in CCMRP. However, CCMRP reports risk-adjusted mortality rates only for 79 hospital reporting units because UC San Diego University Medical Center, which represents two hospitals facilities (Thornton and Hillcrest), submitted combined data for 1997-1998.

of its patients. If the number is lower than 1.0, it means that the hospital had fewer deaths than would have been expected given the case-mix of its patients. **Small differences in the O/E ratio are usually not significant.** Hospitals that have O/E ratios greater than or less than one are not classified as better or worse than expected unless the result is statistically significant.

Overall performance rating (better than expected/worse than expected/no different than expected): The performance category into which a hospital falls depends on the hospital's observed death rate in relation to the 95% confidence interval around the expected death rate. Specifically, statistical significance of a hospital's result is determined by the following:

- If the observed death rate is higher than the upper bound of the 95% confidence interval of the expected death rate, then the hospital's performance is classified as worse than expected.
- If the observed death rate is lower than the lower bound of the 95% confidence interval of the expected death rate, then the hospital's performance is classified as better than expected.

This comparison of the *observed mortality rate* to the confidence interval around the expected mortality rate is a test of statistical significance. An *observed rate* outside the 95% confidence interval of the *expected rate*, indicates with reasonable confidence that the hospital's performance is either better or worse than expected.

Guide to Interpreting the Graphs			
Better than Expected ★	Hospital's observed mortality rate is:	Less than	Lower confidence interval of expected mortality rate
Worse than Expected ▼	Hospital's observed mortality rate is:	Greater than	Upper confidence interval of expected mortality rate
No Different than Expected	Hospital's observed mortality rate:	Falls within	Upper and lower confidence interval of expected mortality rate

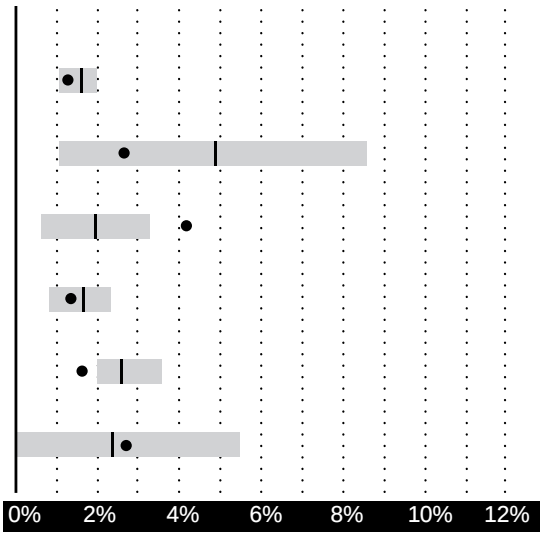
Figures 1-8 present the 1997-1998 bypass surgery results graphically sorted by geographic region, from North to South. It is critical to recognize that, regardless of any individual hospital's performance results, participation in CCMRP represents a significant commitment to quality measurement and improvement by each participating hospital. It is equally important to note that the overall performance rating—that is whether the hospital performed differently than expected—may have been different if data from the 38 non-participating hospitals were included.

The figures display findings according to the following geographical regions in California:

- Sacramento Valley and Northern California Region (Figure 1)
- San Francisco Bay Area and San Jose (Figure 2)
- Central California (Figure 3)
- San Fernando Valley, Antelope Valley, Ventura, and Santa Barbara (Figure 4)
- Greater Los Angeles Area (Figure 5)
- Inland Empire, Riverside, and San Bernardino (Figure 6)
- Orange County (Figure 7)
- San Diego Region (Figure 8)

Figure 1 **COMPARISON OF OBSERVED TO EXPECTED MORTALITY RATE, 1997 – 1998**

Sacramento Valley and Northern California Region	O/E Ratio*
Mercy General Hospital	0.83
Mercy Medical Center—Redding	0.55
▼ Mercy San Juan Hospital	2.15
Redding Medical Center	0.86
★ Sutter Memorial Hospital	0.59
University of California Davis Medical Center	1.23

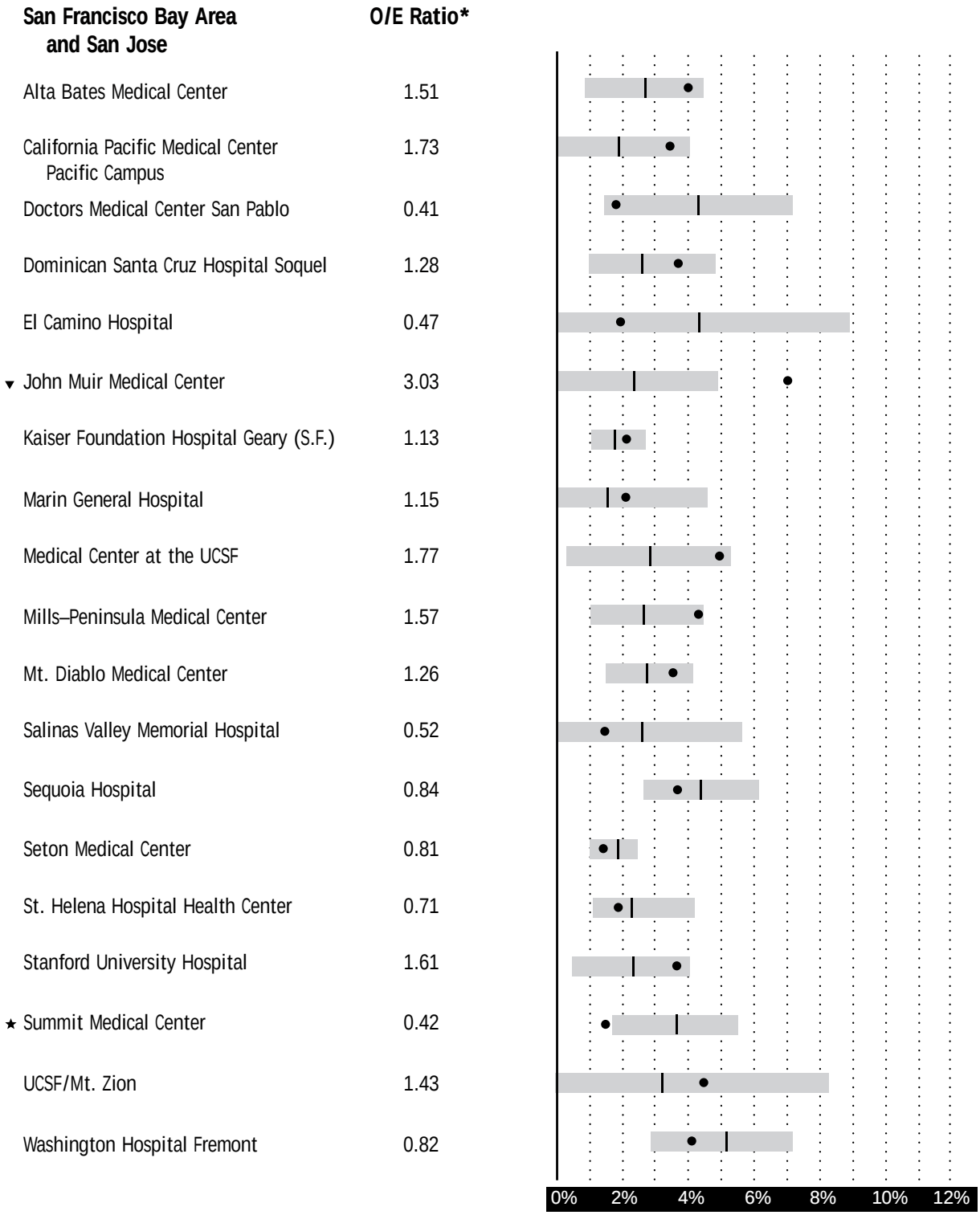


- • Observed Mortality Rate
- | Expected Mortality Rate
- ▭ Range of Expected Mortality Rate (95% Confidence Level)
- ▼ Observed Mortality Rate Significantly Worse than Expected
- ★ Observed Mortality Rate Significantly Better than Expected

*Observed to Expected Events Ratio

NOTE: The following hospitals in this region declined to participate: N.T. Enloe Medical Center – Esplanade Campus

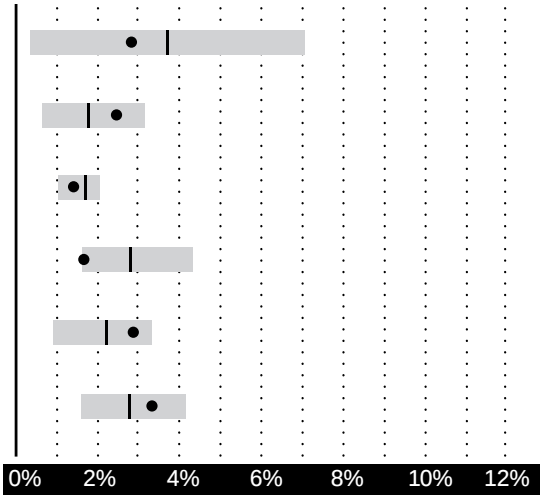
Figure 2 **COMPARISON OF OBSERVED TO EXPECTED MORTALITY RATE, 1997 – 1998**



NOTE: The following hospitals in this region declined to participate: Columbia San Jose Medical Center, O'Connor Hospital, Queen of the Valley Hospital – Napa, Santa Clara Valley Medical Center, Santa Rosa Memorial Hospital, St. Mary's Medical Center – San Francisco, Columbia Good Samaritan Hospital

Figure 3 **COMPARISON OF OBSERVED TO EXPECTED MORTALITY RATE, 1997 – 1998**

Central California	O/E Ratio*
Dameron Hospital	0.76
Doctors Medical Center Modesto	1.34
Kaiser Foundation Hospital Sunset (L.A.)	0.82
Kaweah Delta District Hospital	0.55
Memorial Hospital Modesto	1.39
St. Joseph's Medical Center of Stockton	1.16



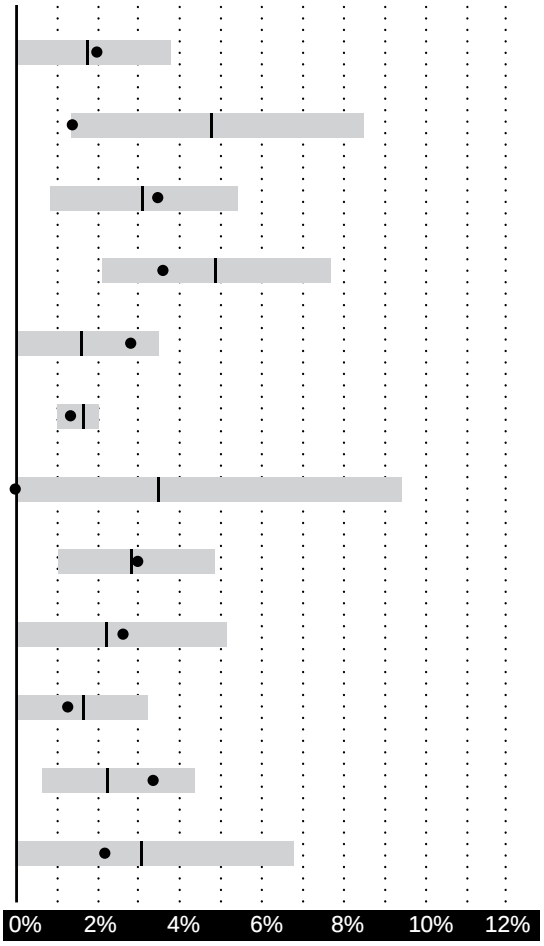
- • Observed Mortality Rate
- | Expected Mortality Rate
- ▒ Range of Expected Mortality Rate (95% Confidence Level)
- ▼ Observed Mortality Rate Significantly Worse than Expected
- ★ Observed Mortality Rate Significantly Better than Expected

*Observed to Expected Events Ratio

NOTE: The following hospitals in this region declined to participate: Bakersfield Memorial Hospital, Fresno Community Hospital and Medical Center, San Joaquin Community Hospital, St. Agnes Medical Center

Figure 4 **COMPARISON OF OBSERVED TO EXPECTED MORTALITY RATE, 1997 – 1998**

San Fernando Valley, Antelope Valley, Ventura and Santa Barbara	O/E Ratio*
Community Memorial Hospital San Buenaventura	1.05
Encino Tarzana Regional Medical Center	0.28
Glendale Adventist Medical Center	1.10
Glendale Memorial Hospital and Health Center	0.73
Granada Hills Community Hospital	1.88
Kaiser Foundation Hospital Sunset (L.A.)	0.82
Lancaster Community Hospital	0.00
Northridge Hospital Medical Center	1.01
Providence Holy Cross Medical Center	1.11
Providence Saint Joseph Medical Center	0.80
Santa Barbara Cottage Hospital	1.33
St. John's Regional Medical Center—Oxnard	0.69



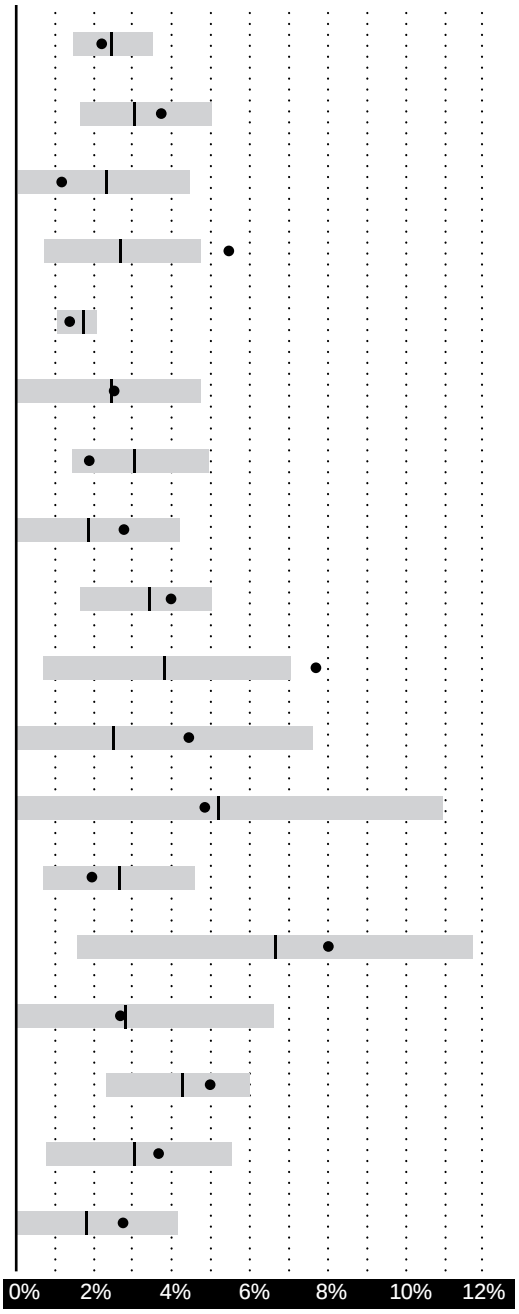
- • Observed Mortality Rate
- | Expected Mortality Rate
- Range of Expected Mortality Rate (95% Confidence Level)
- ▼ Observed Mortality Rate Significantly Worse than Expected
- ★ Observed Mortality Rate Significantly Better than Expected

*Observed to Expected Events Ratio

NOTE: The following hospitals in this region declined to participate: Antelope Valley Hospital Medical Center, Columbia Los Robles Hospital Medical Center, Columbia West Hills Medical Center, French Hospital – San Luis Obispo, Huntington Memorial Hospital, Marian Medical Center, Valley Presbyterian Hospital

Figure 5 **COMPARISON OF OBSERVED TO EXPECTED MORTALITY RATE, 1997 – 1998**

Greater Los Angeles Area	O/E Ratio*
Cedars–Sinai Medical Center	0.88
Citrus Valley Medical Center IC Campus	1.12
Daniel Freeman Memorial Hospital	0.52
▼ Downey Community Hospital	1.99
Kaiser Foundation Hospital Sunset (L.A.)	0.82
Little Company of Mary Hospital	1.04
Long Beach Memorial Medical Center	0.58
Los Angeles County USC Medical Center	1.39
Methodist Hospital of Southern California	1.19
▼ Presbyterian Intercommunity Hospital	1.98
Santa Monica UCLA Medical Center	1.60
St. Francis Medical Center	0.89
St. John's Hospital and Health Center	0.74
St. Mary Medical Center—Long Beach	1.20
St. Vincent Medical Center	0.93
Torrance Memorial Medical Center	1.20
UCLA Medical Center	1.15
USC University Hospital	1.46



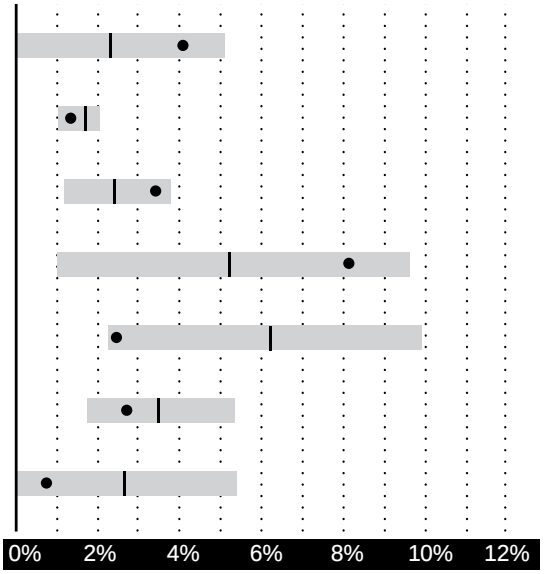
- • Observed Mortality Rate
- | Expected Mortality Rate
- Range of Expected Mortality Rate (95% Confidence Level)
- ▼ Observed Mortality Rate Significantly Worse than Expected
- ★ Observed Mortality Rate Significantly Better than Expected

*Observed to Expected Events Ratio

NOTE: The following hospitals in this region declined to participate: Beverly Hospital, Brotman Medical Center, Centinela Hospital Medical Center, Garfield Medical Center, Hospital of the Good Samaritan, Lakewood Regional Medical Center, Long Beach Community Medical Center, Los Angeles County Harbor–UCLA Medical Center, White Memorial Medical Center.

Figure 6 **COMPARISON OF OBSERVED TO EXPECTED MORTALITY RATE, 1997 – 1998**

Inland Empire, Riverside, and San Bernadino	O/E Ratio*
Desert Regional Medical Center	1.72
Kaiser Foundation Hospital Sunset (L.A.)	0.82
Pomona Valley Hospital Medical Center	1.37
Riverside Community Hospital	1.53
San Antonio Community Hospital	0.40
St. Bernardine Medical Center	0.76
The Heart Hospital, Inc.	0.28



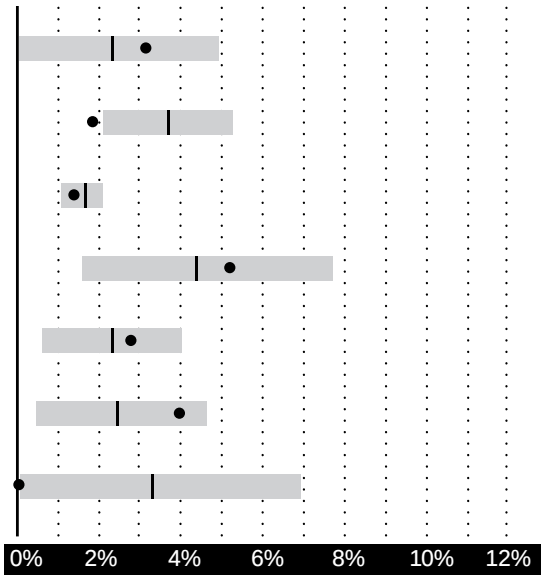
- • Observed Mortality Rate
- | Expected Mortality Rate
- Range of Expected Mortality Rate (95% Confidence Level)
- ▼ Observed Mortality Rate Significantly Worse than Expected
- ★ Observed Mortality Rate Significantly Better than Expected

*Observed to Expected Events Ratio

NOTE: The following hospitals in this region declined to participate: Eisenhower Medical Center, Loma Linda University Medical Center, St. Mary Regional Medical Center

Figure 7 **COMPARISON OF OBSERVED TO EXPECTED MORTALITY RATE, 1997 – 1998**

Orange County	O/E Ratio*
Anaheim Memorial Medical Center	1.30
★ Hoag Memorial Hospital Presbyterian	0.50
Kaiser Foundation Hospital Sunset (L.A.)	0.82
Saddleback Memorial Medical Center	1.12
St. Joseph Hospital Orange	1.22
St. Jude Medical Center	1.56
University of California Irvine Medical Center	0.00



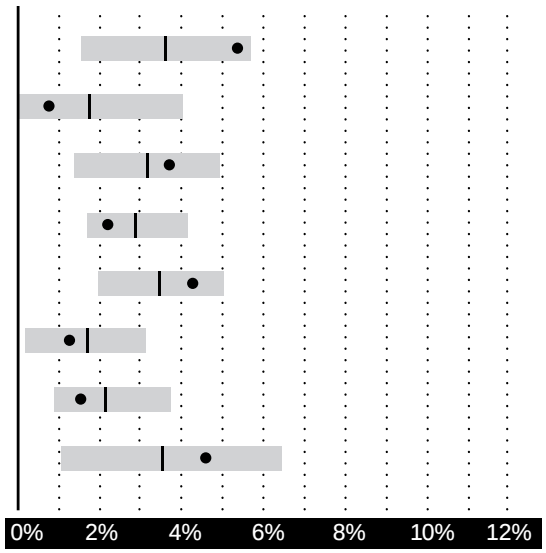
- • Observed Mortality Rate
- | Expected Mortality Rate
- Range of Expected Mortality Rate (95% Confidence Level)
- ▼ Observed Mortality Rate Significantly Worse than Expected
- ★ Observed Mortality Rate Significantly Better than Expected

*Observed to Expected Events Ratio

NOTE: The following hospitals in this region declined to participate: Fountain Valley Regional Hospital and Medical Center – Euclid, Mission Hospital Regional Medical Center, West Anaheim Medical Center, Western Medical Center – Anaheim, Western Medical Center – Santa Ana

Figure 8 **COMPARISON OF OBSERVED TO EXPECTED MORTALITY RATE, 1997 – 1998**

San Diego Region	O/E Ratio*
Alvarado Hospital Medical Center	1.49
Sharp Grossmont Hospital	0.43
Palomar Medical Center	1.17
Scripps Memorial Hospital La Jolla	0.75
Sharp Chula Vista Medical Center	1.21
Sharp Memorial Hospital	0.76
Tri–City Medical Center	0.68
UC San Diego University Medical Center (Thornton and Hillcrest)	1.22



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- ▼ Observed Mortality Rate Significantly Worse than Expected
- ★ Observed Mortality Rate Significantly Better than Expected

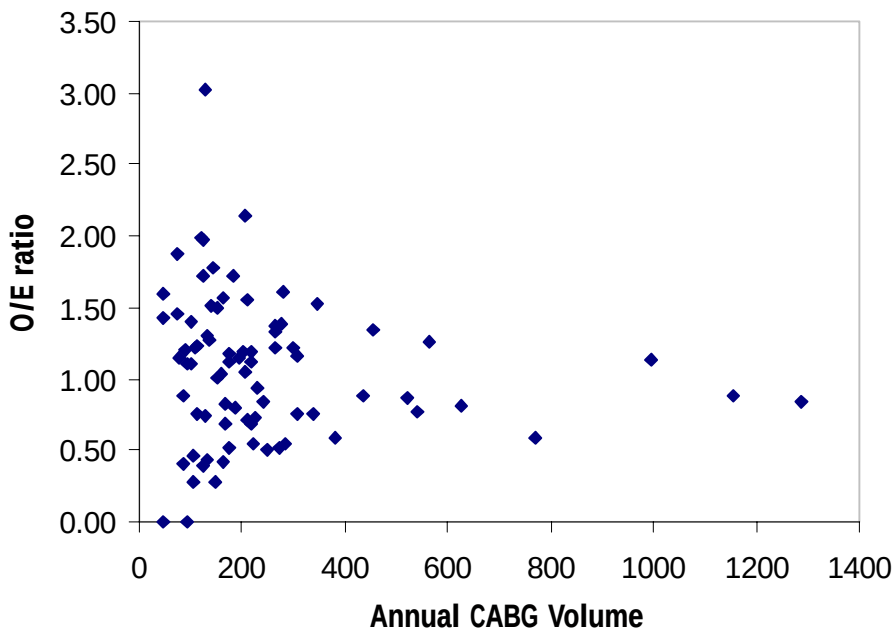
*Observed to Expected Events Ratio

NOTE: The following hospitals in this region declined to participate: Green Hospital of Scripps Clinic, Scripps Mercy Hospital

HOSPITAL VOLUME AND CORONARY ARTERY BYPASS GRAFT OUTCOMES

This report began with the observation that only 50 out of 118 California hospitals perform more than 200 CABG surgeries annually, the minimum number recommended by the American College of Cardiology. We can use the results from CCMRP's 1997-1998 data collection to evaluate whether the volume of CABG surgeries is related to good or bad outcomes. Figure 9 displays a plot that shows the relationship between annual CABG volume and average hospital outcomes, as measured by the O/E ratio. Each dot in Figure 9 identifies a single hospital. For example, the dot near the upper left corner of the figure describes a hospital whose annual volume was 129 CABG cases per year for the 1997-98 period, with an O/E ratio of slightly above 3.0. The rightmost dot in the figure describes a hospital that averaged 1,286 cases per year and exhibits an O/E ratio of 0.86.

Figure 9: Relationship Between CABG Volume and Hospital Outcomes



A regression line through these points is almost flat (it has a very slightly negative slope, but that slope is not statistically significantly different from zero), indicating that for the hospitals that submitted their data to CCMRP, there appears to be no overall relationship between annual volume and risk-adjusted outcome. However, it is clear that lower-volume hospitals exhibit highly variable performance. Both the lowest and the highest risk-adjusted outcomes can be observed among low-volume hospitals. In most cases, the low volumes make those outcomes statistically indistinguishable from an O/E of 1.0 (i.e., given wide confidence intervals around

the expected mortality rate). In contrast, there is much less variability among higher-volume hospitals. It is possible that with future data and analysis the lowest statistically valid O/E ratio will occur in a low volume hospital; however, it will take several additional years to accumulate enough cases to validly characterize O/E ratios in low-volume hospitals. While the lowest O/E ratios can be found among low-volume hospitals, none of the highest volume hospitals have a poor O/E ratio.

KEY FINDINGS

This report presents findings from an analysis of 1997-1998 data collected from 79 of California's 118 hospitals that regularly performed CABG surgery, and focuses on the death rate while a patient remains in the hospital after undergoing bypass surgery.[14] The study includes 30,814 cases, making it the largest public reporting program on CABG outcomes in the U.S.

This study finds that 72 out of the 79 hospitals that participated in CCMRP's reporting program performed "as expected." This means that given the complexity of cases they treated, the actual death rates at these institutions were within the range of what was expected or predicted from the risk model. Three of the 79 hospitals performed significantly better than expected (meaning their actual death rate was lower than what was expected/predicted):

- Hoag Memorial Presbyterian Hospital, serving Orange County
- Summit Medical Center, serving the San Francisco Bay Area and San Jose
- Sutter Memorial Hospital, serving Sacramento Valley and Northern California.

In addition, four of the 79 hospitals performed significantly worse than expected (meaning their actual death rate was higher than what was expected/predicted):

- Downey Community Hospital, serving greater Los Angeles
- John Muir Medical Center, serving the San Francisco Bay Area and San Jose
- Mercy San Juan Hospital, serving Sacramento Valley and Northern California
- Presbyterian Intercommunity Hospital, serving greater Los Angeles.

It is also important to highlight several other key findings from the analysis of the 1997-1998 CABG data submitted by California hospitals.

- Raw unadjusted mortality rates give a false impression of a hospital's relative performance, underscoring the importance of risk-adjustment when making comparisons across hospitals.

[14] If a patient is transferred post-operatively to a rehabilitation or transitional care facility and dies before going home, this death is not counted. In-hospital mortality means the patient expired prior to discharge from the hospital that performed the operation, regardless of length of stay. Deaths are not counted after discharge even if the patient dies soon after the operation and discharge from the hospital.

- There is wide variation among California hospitals in their mortality rates for isolated coronary artery bypass graft surgery, even after adjusting for patient risk.
- The high degree of agreement between the actual and predicted number of deaths (see Technical Report) underscores that hospitals should not exclude high risk (i.e., sicker) patients from appropriate CABG surgeries in order to improve their performance scores.
- An examination of the relationship between volume of CABG procedures and outcome finds large variation in the performance results of small-volume hospitals and small variation in the performance results of large-volume hospitals.

One caveat should be noted. Because CCMRP did not have data from 38 non-participating hospitals, direct comparison of risk-adjusted mortality rates is not possible. However, an examination of OSHPD hospital discharge data shows that the aggregated raw or unadjusted mortality rates for participating hospitals are essentially identical to those of non-participating hospitals. On average, participating hospitals performed more CABG surgeries than non-participating hospitals (250 per year vs. 209 per year).

One year's results—especially among hospitals with small annual volumes of CABG surgeries—are not sufficient for drawing definitive conclusions about the performance of any given hospital. It will be important to evaluate the performance of hospitals over multiple years to determine whether there is a consistent pattern of performance, either good or bad.

PBGH and OSHPD wish to thank each of the 79 hospitals that volunteered to participate and publicly report their risk-adjusted mortality rates for the 1997-1998 data collection period. It is important to recognize that, regardless of any individual hospital's performance results, participation in CCMRP represents a significant commitment to quality measurement and improvement by each of the participating hospitals.

TAKE AWAY MESSAGES

California's first round of CABG mortality reporting yields several key messages that are important for physicians and hospitals, as well as for policymakers, purchasers, and consumers.

The CCMRP is a voluntary effort that has required a great deal of cooperation, effort, and resources on the part of the provider community—including physicians, hospital administrators, data collectors, and others. Their willingness to commit resources to this endeavor reveals an explicit commitment to quality measurement and improvement.

The analysis of the 1997-1998 hospital data shows variation in risk-adjusted mortality rates for CABG surgery that may indicate differences in processes of care and practice patterns. Differences in risk-adjusted CABG mortality rates reveal quality differentials that may reflect variations in:

- Pre-operative care;
- Surgical practices;
- Overall interaction and coordination of the surgical team—including cardiac surgeons, cardiologists, perfusionists, anesthesiologists, and nurses; and,
- Post-surgical care.

Such variation highlights opportunity for improvement, especially for hospitals with higher than expected mortality rates. Professional organizations, provider groups, and hospitals can use this information to bolster quality review of surgical practices and processes of care across hospitals. Additionally, an individual hospital, armed with information on its performance relative to others, can maintain, review, and improve the quality of CABG care it delivers by implementing best practices. Referring physicians and cardiac surgeons, who act as advocates for their patients, using patient-specific knowledge and hospital-specific information, can work with patients to make appropriate referrals and treatment decisions.

Patients with heart disease, who may be candidates for CABG, and their caregivers can work with physicians to become more informed of treatment options. Additionally, through their efforts to coordinate and assure the quality of care, employers and health plans can work to inform employees and health plan enrollees of comparative treatment information and ensure access to hospitals that demonstrate good outcomes for their patients.

PBGH and OSHPD will post the Summary and Technical Reports on their organizational websites (www.pbgh.org and www.oshpd.state.ca.us). Additionally, PBGH will post the hospital-specific results of the CABG study on its ***California Consumer HealthScope*** (www.healthscope.org) a public information source for consumers to use to make more informed health care choices. PBGH and OSHPD are currently collecting the 1999 data from hospitals and expect to produce a second public report late Fall 2001. California hospitals that do not participate in CCMRP are welcome to join at any time. For more information about training, software, policy, or other issues, please call Dr. Cheryl Damberg of PBGH (310.396.7036) or Mary MacDonald of OSHPD (916.322.9137).

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Stanislaus County

Target Stores

Transamerica Corporation

Union Bank of California

University of California

Varian, Inc.

Verizon Communications

Wells Fargo & Company

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